

I. REMARKS

The Examiner rejects claims 1-4 and 6-8 as obvious over the combination of U.S. Patent 5,766,016 to Sinclair (hereafter the “Sinclair Patent”) in view of U.S. Patent 5,353,073 to Kobayashi (hereafter the “Kobayashi Patent”) and U.S. Patent 6,454,410 B1 to Berger et al. (hereafter the “Berger Patent”) while additionally invoking multiple “Official Notices” and proffering multiple “inherency” arguments with respect to the teachings of both an alleged “Official Notice” and the also cited Kobayashi Patent.

A. The Invention

The present invention pertains broadly to methods for displaying an eyeground three dimensionally and measuring the coordinates thereof, such as may be used to image and display the actual sizes and shapes of eyeballs of different people. A method of three dimensionally displaying an eyeground and measuring the coordinates is claimed in independent claim 1. A computer readable storage medium that stores a program for displaying an eyeground three dimensionally and measuring the coordinates thereof is provided to operate the computer as claimed in independent claim 6. A method of three dimensionally displaying an eyeground and measuring the coordinates is claimed in independent claim 7. A computer readable storage medium that stores a program for displaying an eyeground three dimensionally and measuring the coordinates thereof is provided to operate the computer as claimed in independent claim 8.

Various other embodiments, in accordance with the present invention, are provided in the dependent claims. All of the embodiments of the present invention involve measuring “a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a

plurality of positions on the eyeground” and “setting an eyeball template according to the measured length and radii,” which provides the advantage that, even if the eyeball that is measured is deformed from being a perfect sphere, an accurate template can be set. This feature is advantageous because the eyeballs of different people (i.e., patients) vary individually in size and shape. Furthermore, the embodiments of the present invention involve “pasting a number of images on the eyeball template according to the eyeball parameter,” which makes it possible to precisely produce a three dimensional image of the eyeground even when the eyeball of a person (i.e., patient) is deformed from being a perfect sphere (i.e., is not a perfect sphere).

In addition, the invention provides the entirely unexpected advantage that an accurate eyeball template can be set even if the eyeball is deformed from being a perfect sphere.

B. The Rejections

Claims 1-4 and 6-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sinclair et al. (U.S. Patent 5,766,016, hereafter the “Sinclair Patent”) in view of Kobayashi (U.S. Patent 5,353,073, hereafter the “Kobayashi Patent”) and Berger et al. (U.S. Patent 6,454,410 B1, hereafter the “Berger Patent”).

Applicants respectfully traverse the rejections and request reconsideration of the above-captioned application for the following reasons.

Applicants clearly demonstrate that the cited prior art neither teaches nor suggests numerous elements of the invention as claimed. The Examiner implicitly admits the insufficiency of the cited prior art by attempting to invoke numerous alleged “Official Notices” and inherency arguments based on the alleged Official Notices. Because the

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rejection cannot be sustained based on the cited prior art, applicants address the improper alleged Official Notices first.

C. Applicants' Arguments Re: Alleged Official Notices

i. The Examiner's Attempt to invoke Official Notices is Improper under USPTO Practice and Applicants' did not Acquiesce in any Attempted Notice.

The Examiner has not properly invoked any of his alleged "Official Notices" as required by the MPEP of the United States Patent and Trademark Office. See MPEP § 2144.03. The prior Office Action of April 4, 2006 makes no mention of any Official Notice. The rejection applied to the claims was as follows:

Claims 1-6 are rejection under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,766,016 to Sinclair ("Sinclair") in view of U.S. Patent 5,353,073 to Kobayashi ("Kobayashi") and U.S. Patent 6,454,410 B1 to Berger et al. ("Berger").

Office Action dated April 4, 2006.

As can be seen from the above, no mention is made of any "Official Notice" in formulating the rejection, and the term appears nowhere in the action. Furthermore, it is absolutely unambiguous that the applicants did not acquiesce in any assertion that claim limitations were "known in the art." Applicants made abundantly clear in their response no prima facie showing of obviousness had been established because numerous claim limitations, were not taught or suggested by the prior art. See, e.g., Applicant's response of June 30, 2006, pp. 18-19.

In the Office Action of April 4, 2006, at 5, lines 1-5, the Examiner made the following statement:

“Regarding the limitations of matching images to the eyeground template, routines for texture mapping of two-dimensional images to three-dimensional surfaces are known in the art and include any number of processing routines for calculating relative offsets and coordinate transformations between a planar surface and a three-dimensional surface in order to place said images onto said three-dimensional surface” (emphasis added).

In the same Office Action at 5, lines 5-7, the Examiner made the following statement:

“One of ordinary skill in the art would be apprised that to map a 2-D image to a 3-D surface, a positional relationship between the two would necessarily defined and utilized to perform said mapping.” (emphasis added).”

Applicants specifically denied the examiner’s unsupported conclusions, to the extent that they are capable of being understood. See Amendment B dated June 30, 2006, pp. 18-19. More specifically, applicants denied that prior art of record either taught or suggested the claimed steps of “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6.” Applicants also denied that prior art of record either taught or suggested the steps: (2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8. *Id.* Applicants lastly denied that the prior art either taught or

suggested the claimed steps of “(D) obtaining an eyeball parameter g that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6, and “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8. As is clear from Applicants’ Amendment B, even if a proper Official Notice had been made—which it clearly was not—the unsupported conclusions of the Examiner which he claims constituted one or more Official Notices were unambiguously rejected by the Applicant.

ii.. The Alleged “Official Notices” are Defective as a Matter of Law

The Federal Circuit has made it clear that Section 103 rejections of patent application claims by the USPTO must be based on substantial evidence and cannot be sustained based on assertions of “basic knowledge” and “common sense.” In re Zurko, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001). For this reason alone, any “Official Notice” made by the Examiner that is not based on “substantial evidence” is insufficient to sustain the Section 103 rejection pending against the instant claims. In this case, none of the Examiner’s alleged “Official Notices” are supported by any evidence in the record.

The MPEP clearly states, at Section 2144.03 (A) (emphasis added):

“It would **not** be appropriate for the examiner to take official notice of facts without citing prior art references where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well known. For example **assertions of technical facts in the areas of esoteric technology** or specific knowledge of the prior art **must always**

be supported by citation to some reference work recognized as standard in the pertinent art.” It is clear from the record that the facts that the Examiner is attempting to notice are not capable of instant and unquestionable demonstration, and therefore cannot be notices under the MPEP’s own guidelines.

For all of the above reasons, any previous attempts to notice facts are improper under the USPTO’s own guidelines as provided in the MPEP, and improper as a matter of law. To the extent that the Examiner is now trying to make Official Notices of prior unsupported conclusions, Applicants request that the Examiner provide “substantial evidence” (e.g., a prior art reference) in support of the “Official Notice” on page 4, lines 5-7, of the Office Action of April 4, 2006 as required by the Federal Circuit in In re Zurko, 59 U.S.P.Q.2d at 1697.

The Examiner contends that Applicants have “admitted” the subject matter of the Examiner’s alleged “official notices” to be “prior art” (Office Action, dated April 4, 2006, at 2, lines 19-22). The Federal Circuit has held that admissions of “prior art” during prosecution require some statement by the Applicant to that effect. See Riverwood International Corp v. R.A. Jones & Co., 66 U.S.P.Q.2d 1331, 1337 (Fed. Cir. 2003). In this case, Applicants have not made any affirmative statement admitting the Examiner’s alleged “official notices.” On the contrary, as discussed above, applicants have consistently denied that the cited art creates a prima facie showing of obviousness because numerous claim elements are neither taught nor suggested by the prior art. Applicants have specifically stated repeatedly that those specific claim elements which the Examiner is attempting to notice are not taught or suggested in the prior art.

For all of the above reasons, the Examiner's assertion of "Official Notice" are improper as a matter of USPTO practice and law and cannot properly sustain the Section 103 rejection standing against Applicants' claims. Consequently, the Section 103 rejection is untenable and must be withdrawn.

iii. The New Official Notice

In the most recent Office Action of Examiner proffers yet another "Official Notice" that means for obtaining information regarding the shape of the eye, including axial length of the eye and curvature of the eyeground, is "common knowledge in the art" and cites U.S. Patent 4,261,367 to Freese (hereafter, the "Freese Patent") and U.S. Patent 4,564,018 to Hutchinson (hereafter, the "Hutchinson Patent") (Office Action, dated September 15, 2006, at 2, lines 4-8). The Examiner does not point out where in the Freese Patent or the Hutchinson Patent the "common knowledge" is found, which is not permissible. See *In re Rijckaert*, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993), *citing In re Yates*, 211 U.S.P.Q. 1149, 1151 (C.C.P.A. 1981) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference).

Neither the Freese Patent nor the Hutchinson Patent teach, or suggest, the subject matter that the Examiner asserts is "common knowledge." In particular, the Freese Patent and the Hutchinson Patent do not teach a "measuring a length from a surface of a cornea to the eyeground...and radii of curvatures of at a plurality of positions on the eyeground" as recited in independent claims 1, 6, 7 and 8. Thus, the Freese and Hutchinson Patents also do not

teach, or suggest, “setting an eyeball template according to the measured length and radii” and the accurate “eyeball template” used to display eyeground images on a display device as are also recited by independent claims 1, 6, 7 and 8, such as have the effect of setting an accurate eyeball template even if the eyeball is deformed from being a perfect sphere.

For all of the above reasons, Applicants respectfully traverse the Examiner’s new “Official Notice” and request that evidence be provided to support the Examiner’s position, or the position be withdrawn.

iv. The Examiner’s Inherency Arguments

An asserted inherent teaching of a reference may not be established by mere probabilities or possibilities, but must be the natural result flowing from a sufficient disclosure. Continental Can Co. USA Inc. v. Monsanto Co., 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). Whether a prior art reference includes an inherent teaching is a question of fact. In re Napier, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). In this case, the Examiner argues that the Kobayashi Patent and his alleged “Official Notice” contain inherent teachings (Office Action, dated September 15, 2006, at 2, lines 9-13, and at 3, lines 8-12). Applicants disagree for the following reasons.

First, the Examiner contends that the Kobayashi Patent inherently teaches that the data acquired by the device shown in Figure 1 would contain information regarding the curvature of the eyeground because the device acquires a surface profile of the eyeground (Office Action, dated September 15, 2006, at 2, lines 9-13). The Kobayashi Patent is completely

silent with respect to acquiring eyeground data that includes information regarding the curvature of the eyeground. Therefore, the teachings of the Kobayashi Patent are not sufficient to show that acquiring eyeground curvature information is the natural result flowing from the disclosure and not merely some possibility or probability. A person of ordinary skill in the art would not necessarily conclude that the information collected by Kobayashi's device includes eyeground curvature information. Consequently, the Examiner has failed, as a matter of fact, to establish that the Kobayashi inherently teaches acquiring eyeground curvature data.

Second, the Examiner contends that the alleged "Official Notice" teaches "an eyeball parameter g that represents a positional relationship between the eyeground and the acquired images" because a positional relationship between the 2-D image and a 3-D surface is necessarily defined and utilized during a texture mapping procedure (Office Action, dated September 15, 2006, at 3, lines 8-12). On its face, this is a new "official notice" because it asserts new "parameter g" as being common knowledge. Applicants' traverse the Examiner's new "Official Notice" on the grounds that the subject matter is a technical fact in an esoteric technology and must be supported by a citation to some reference. See In re Ahlert, 165 U.S.P.Q. 418, 420 (C.C.P.A. 1970).

In other words, inherency cannot be properly used to extend the teaching of an "official notice," especially one as unclear and nonsensical as the statement made by the Examiner in the Office Action of April 4, 2006. The Examiner in this case is simply implicitly acknowledging that the cited prior art does not teach or suggest all of the elements of the present claims. For the reasons above, the Examiner cannot as a matter of law and

USPTO practice make up for this deficiency with a defective Official Notice.

D. Applicants' Arguments Regarding the Cited Prior Art of Record

A *prima facie* case of obviousness requires a showing that the scope and content of the prior art teaches each and every element of the claimed invention, and that the prior art provides some teaching, suggestion or motivation to combine the references to produce the claimed invention. *In re Oetiker*, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992); *In re Vaack*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). In this case, the Examiner has failed to establish a *prima facie* case of obviousness because none of the prior art references teach, or suggest:

(1) the steps of : “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6; or

(2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8.

i. The Sinclair Patent

The Sinclair Patent teaches a “surgical simulator and method for simulating surgical procedure,” wherein photographs of the sclera, iris, zonules and retina of an actual eye are taken and then texture mapped on geometric surfaces, and a three-dimensional mathematical model of the eye is developed from the geometric surfaces in order to portray a visual image of an eye for the purposes of simulating eye surgery (col. 8, lines 32-58). As admitted by the Examiner, the Sinclair Patent does not teach, or suggest, measuring the eye to determine the geometric surface or taking and mapping multiple images of the retina to form a three-dimensional model (Office Action, dated September 15, 2006, at 4, lines 6-7; and Office Action, dated April 4, 2006, at 4, lines 11-12). Thus, the Sinclair Patent does not teach, or suggest,

(1) the steps of : “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6; or

(2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8.

However, this is not the only deficiency in the teachings of the Sinclair Patent. The Sinclair Patent also does not teach, or even suggest, (3) “(D) obtaining an eyeball parameter g

that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6, and “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8 of the instant application.

ii. The Kobayashi Patent

The Kobayashi Patent teaches a “three-dimensional shape measurement system” as shown in Figure 1 that produces three-dimensional information of an object, such as the fundus of an eye, by directing light onto the object, receiving the light reflected from the object, photoelectrically converting the received light and processing the resulting electric signal (See Abstract). The system shown in Figure 1 is provided with laser beam control circuitry for focal point shifting in the direction of the optical axis and a pair of detectors for detecting variation in the focal position of light reflected from the object (eye fundus) and deriving information with respect to the shape of the object in the direction of the optical axis (See Abstract). The Kobayashi Patent is completely silent with respect to “measuring length from the surface of the cornea to the eyeground of an eyeball” as recited in claims 1 and 6. Thus, the Kobayashi Patent does not teach, or suggest, (1) the steps of : “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6, and (2) “a shape measuring step (A) in which a length from surface of a cornea to the

eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8.

However, this is not the only deficiency in the teachings of the Kobayashi Patent. The Kobayashi Patent also does not teach, or even suggest, (3) “(D) obtaining an eyeball parameter g that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6, and “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8 of the instant application.

iii. The Berger Patent

The Berger Patent teaches “mosaicing and enhancement of images for ophthalmic diagnosis and documentation,” which provides a method for mosaicing images of the eye to create high resolution, wide-field ophthalmic images by acquiring a first image of the eye and by acquiring a second image of the eye, then processing the two images to produce a mosaic representation (See Abstract). The second image includes a portion of the first image, and to guide in acquiring the second image, the first image may be viewed while acquiring the second image using either a direct ophthalmoscope or a slitlamp biomicroscope (See Abstract). Images may be converted to digital format, and the processing of the images

includes aligning and merging the images, and conducting real-time processing and non-real time processing (See Abstract).

However, the Berger Patent is completely silent with respect to “measuring length from the surface of the cornea to the eyeground of an eyeball” as recited in claims 1 and 6. Thus, the Berger Patent does not teach, or suggest, (1) the steps of : “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6, and (2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8.

However, this is not the only deficiency in the teachings of the Berger Patent. The Berger Patent also does not teach, or even suggest, (3) “(D) obtaining an eyeball parameter g that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6, and “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8 of the instant application.

Because neither the Sinclair Patent, the Kobayashi Patent nor the Berger Patent teach, or suggest, multiple limitations of the independent claims 1 and 6-8, such as (1) the steps of: “(A) measuring a length from surface of a cornea to the eyeground of an eyeball and radii of

curvatures at a plurality of positions on the eyeground using a measuring device” and “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6, and (2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” and “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8, and (3)“(D) obtaining an eyeball parameter g that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6, and “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8, it is plain that the combination of the Sinclair Patent, the Kobayashi Patent and the Berger Patent cannot establish a prima facie case of obviousness against the instant claims.

iv. No Proper Motivation to Justify Combining Teachings

A proper rejection under Section 103 also requires showing (1) that the prior art would have suggested to a person of ordinary skill in the art that they should make the claimed device or carry out the claimed process, (2) that the prior art would have revealed to a person of ordinary skill in the art that in so making or doing, there would have been a reasonable expectation of success, and (3) both the suggestion and the reasonable expectation of success must be found in the prior art and not in the applicants’ disclosure. In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). In this case, the Examiner has failed to show a proper motivation

to justify the combination of teachings for the following reasons.

Specifically, the Examiner presently bases the Section 103 Rejection on the combination of the Sinclair Patent, the Kobayashi Patent, the Berger Patent, at least three alleged “Official Notices” and two inherency arguments. For the reasons above, non of the alleged Official Notices are proper as a matter of USPTO practice or law. In fact the desperate attempt to claim, incorrectly, that Applicants have admitted the substance of the alleged Official Notices only emphasizes the insufficiency of the cited prior art to form any prima facie showing of obviousness.

Furthermore, the Examiner has entirely failed to show a motivation, grounded in the prior art, to suggest combining the various cited teachings and alleged common knowledge to arrive at Applicants’ claimed invention. On the contrary, it is evident that the Examiner is employing impermissible hindsight to make a facsimile of the invention using the three patents and three “Official Notices” to form a mosaic. Northern Telecom, Inc. v. Datapoint Corp., 15 U.S.P.Q.2d 1321, 1323 (Fed. Cir. 1990).

For all of the above reasons, the Examiner has failed to adduce a suggestion, grounded in the prior art and not Applicants’ disclosure, to justify the Section 103 rejection.

II. CONCLUSION

The Examiner’s rejection of claims 1-4 and 6-8 under 35 U.S.C. § 103(a) is untenable and should be withdrawn because the combined teachings of the prior art of record fails to teach, or suggest,

(1) the steps of : “(A) measuring a length from surface of a cornea to the eyeground of

an eyeball and radii of curvatures at a plurality of positions on the eyeground using a measuring device” or “(B) setting an eyeball template according to the measured length and radii” as recited in independent claims 1 and 6;

(2) “a shape measuring step (A) in which a length from surface of a cornea to the eyeground of an eyeball and radii of curvatures at a plurality of positions on the eyeground are measured using a measuring device” or “an eyeball setting step (B) for setting an eyeball template according to the measured length and radii” as recited in independent claims 7 and 8; or

(3)“(D) obtaining an eyeball parameter g that represents a positional relationship between the eyeground and images according to positions H of superimposed portions on the images;” as recited by independent claims 1 and 6; or “a parameter setting step (D) for obtaining an eyeball parameter g that represents the positional relationship between the eyeground and images according to positions H of the superimposed portions on the images” as recited in claims 7 and 8.

The Examiner’s Section 103 rejection is further untenable and must be withdrawn because it relies upon defective alleged “Official Notices” and inherency arguments not supported by “substantial evidence” in the record.

The Examiner has also failed to adduce a proper suggestion, grounded in the prior art and not Applicants’ disclosure, to justify the combination of the Sinclair Patent, the Kobayashi Patent and the Berger Patent with three alleged “Official Notices.”

Lastly, even if a prima facie showing of obviousness had been made, which is has not, the unexpected advantages of the present invention rebut any such showing of obviousness.

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Specifically, the invention has the entirely unexpected advantage that an accurate eyeball template can be set even if the eyeball is deformed from being a perfect sphere.

For all of the above reasons, claims 1-4 and 6-8 are in condition for allowance and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below-signed attorney for Applicants.

Respectfully submitted,

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A handwritten signature in black ink, appearing to be 'Joerg-Uwe Szapl', written over a horizontal line.

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